

San Luis Obispo County, and eradication efforts undertaken as necessary.

The potential is great for harm by *R. decollata* to the unique, endemic land snail fauna of San Nicolas Island. Among the strictly endemic native snails, *Micrarionta opuntia* Roth 1975, never attains a shell diameter of more than about 10.3 mm; the mean adult shell diameter of *Micrarionta feralis* (Hemphill, 1901) is around 15 mm (Pearce, 1990; Roth, 1996). For these species, the "refuge" of a size greater than 15 mm diameter (which allows *Helix aspersa* to persist at low numbers in the presence of *R. decollata*) is unavailable. In addition, the total known range of *M. feralis* covers only a few hundred square meters.

The San Nicolas Island species *Xerarionta tryoni* (Newcomb, 1864) attains an adult shell diameter of 19–28 mm. Size-frequency distribution of a population observed in 1981 suggests that maximum shell size and sexual maturity are attained late in the second or early in the third year of life. A shell diameter of 15 mm is probably not attained until the second year of life (BR, unpublished observations). Time to maturity in *Helix aspersa* varies, but in a coastal southern California setting with artificially applied water, snails matured in 6–8 months (Potts, 1975). Under laboratory conditions, a shell diameter of 15 mm was attained in about 25–45 days (Potts, 1975; fig. 2). Juvenile *Xerarionta tryoni* spend more time in the vulnerable < 15-mm size class than do juvenile *Helix aspersa*, and therefore the potential impact of predation upon populations of *X. tryoni* is greater than that recorded for *H. aspersa*.

The apparent localization and slow spread of *Rumina decollata* on San Nicolas Island suggest that its eradication on that island may be possible.

Acknowledgments. Jim Carlton, Rob Cowie, Tim Pearce, and David Robinson read and commented on a draft of the manuscript, Jim Strampe helped produce the California distribution map, and Frank Focha and John Warrick (CDFA) helped interpret the pertinent regulations. We are grateful to Tim Pearce, Sally Walker, Ken Warheit, Alicia Cordero, David Lindberg, and others who helped search for *R. decollata* on San Nicolas Island.

Literature Cited

- BATTS, J. H. 1957. Anatomy and life cycle of the snail *Rumina decollata* (Pulmonata: Achatinidae). *Southwestern Naturalist* 2(2–3):74–82.
- CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA). 1998. Plant Quarantine Manual. Pest Exclusion Branch, Plant Health And Pest Prevention Services Division. Animal Policy section updated on 12 January 2000.
- DUNDEE, D. S. 1970. Introduced Gulf Coast molluscs. *Tulane Studies in Zoology and Botany* 17(3):101–115.
- DUNDEE, D. S. 1974. Catalog of introduced mollusks of eastern North America (north of Mexico). *Sterkiana* 55:1–37.
- FISHER, T. W. 1966. *Rumina decollata* (Linnaeus, 1758) (Achatinidae) discovered in southern California. *The Veliger* 9(1):16.
- FISHER, T. W. & R. E. ORTH. 1985. Biological control of snails. Occasional Papers, Department of Entomology, University of California, Riverside 1. viii + 111 pp.
- FISHER, T. W., R. E. ORTH & S. C. SWANSON. 1980. Snail against snail. *California Agriculture* 34(11–12):18–20.
- PEARCE, T. A. 1990. Phylogenetic relationships of *Micrarionta* (Gastropoda: Pulmonata) and distinctness of the species on San Nicolas Island, California. *Malacological Review* 23:1–37.
- PEARCE, T. A. 1993. *Micrarionta* (Gastropoda:Pulmonata) on San Nicolas Island, California. Evolutionary relationship among the species. *Malacological Review* 26:15–50.
- POTTS, D. C. 1975. Persistence and extinction of local populations of the garden snail *Helix aspersa* in unfavorable environments. *Oecologia* 21:313–334.
- ROBINSON, D. 1999. Alien invasions: the effects of the global economy on non-marine gastropod introductions into the United States. *Malacologia* 41:413–438.
- ROTH, B. 1996. The fossil land snail *Micrarionta (Micrarionta) intermedia* Pilsbry (Gastropoda: Pulmonata): insular phylogeny revisited. *The Veliger* 39(3):204–212.
- ROTH, B. & C. M. HERTZ. 1997. Recent records of *Cochlicella barbara* (Linnaeus, 1758) (Hygromiidae) in southern and central California. *The Festivus* 29(9):81–83.
- SELANDER, R. K. & D. W. KAUFMAN. 1973. Self-fertilization and genetic population structure in a colonizing land snail. *Proceedings of the National Academy Sciences of the U.S.A.* 70(4):1186–1190.
- SELANDER, R. K. & R. O. HUDSON. 1976. Animal population structure under close inbreeding: the land snail *Rumina* in southern France. *American Naturalist* 110(974):695–718.
- SELANDER, R. K., KAUFMAN, D. W. & R. S. RALIN. 1974. Self-fertilization in the terrestrial snail *Rumina decollata*. *The Veliger* 16(3):265–270.

The Occurrence of the Shell-Less Neritacean Gastropod *Titiscania limacina* in the Galapagos Islands

José Templado

Museo Nacional de Ciencias Naturales (CSIC),
José Gutiérrez Abascal, 2, 28006 Madrid, Spain
and

Jesús Ortea

Departamento de Biología de Organismos y Sistemas,
Laboratorio de Zoología, Universidad de Oviedo,
33071 Oviedo, Spain

Only two species of shell-less neritacean gastropods of the family Titiscanidae have been described: *Titiscania limacina* Bergh, 1875, and *T. shinkishihataii* Taki, 1955. The former was discovered and drawn by Carl Semper during his voyage to the Philippines, and it was first named by Bergh (1875; pl. 41, fig. 10) based on Semper's figure. Later, Bergh (1890) published a complete description based on additional specimens from Mauritius. This species has been also recorded in the Eastern Pacific Ocean from the Gulf of California to Panama (Marcus & Marcus, 1967; Houston, 1990; personal observation); in the Eniwetock Atoll (Marcus & Marcus, 1967); in north-

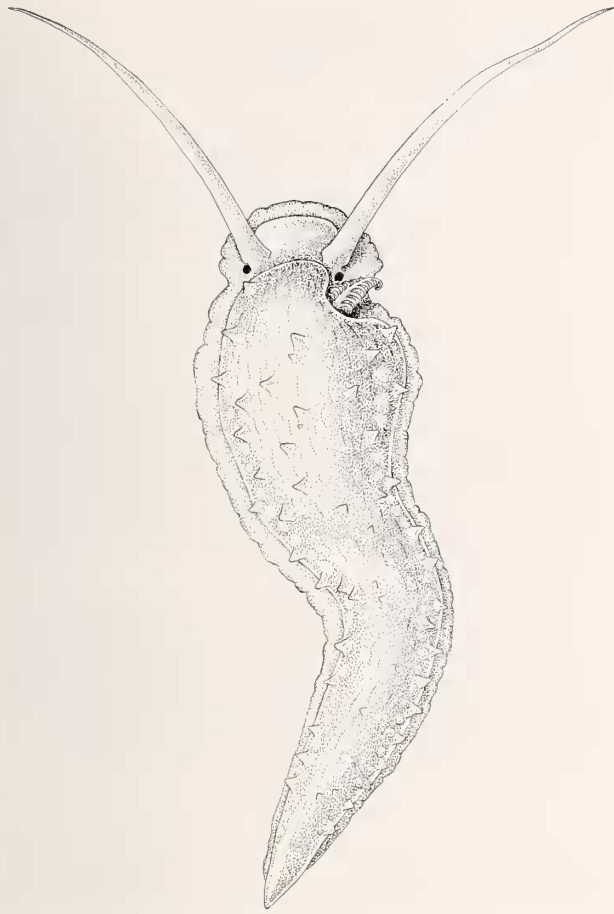


Figure 1. Specimen of *Titiscania limacina* from Puerto Ayora, Santa Cruz, Galapagos Islands (17 mm in length).

east Australia (Burn, 1975); and in the Molucas (Strack, 1998). Taki (1955) described the second species of this genus in Japan, *Titiscania shinkishihataii*, which was re-discovered and redescribed by Saito & Tsuchiya (1990). The differences between both species might not be considered specific characters because some minor differences have also been found in specimens from distant geographic areas, perhaps as a result of their different stage of conservation or as a consequence of the methods used to study the slugs. Therefore, both taxa might be synonyms. Nevertheless, according to Scott & Kenny (1998), the Titiscanidae remains a poorly known group with few specimens available for study.

Titiscania limacina, despite being a shallow-water gastropod recorded from the west American continental coast and from some eastern Pacific islands, is not known from any of the eastern Pacific oceanic islands, as pointed out by Emerson (1991) in his study on the tropical trans-Pacific prosobranch gastropods. The malacofauna of the Galapagos Islands is, without doubt, the best studied of all eastern Pacific islands (see the reviews of Finet, 1991,

1994). However, *Titiscania limacina* has never been recorded there until now.

During a Spanish scientific trip to the Galapagos Islands in 1991, organized by the Museo de Ciencias Naturales de Tenerife, Canary Islands, three specimens of this species were found. These specimens were collected off Puerto Ayora, Santa Cruz Island, in front of the Charles Darwin Research Station (6 March 1991). The three specimens were found beneath intertidal rocks, covered by white compound ascidians of the family Didemnidae. They measured alive 11, 14, and 17 mm when crawling. At resting position they were notably shorter. The external appearance of our specimens (Figure 1) does not differ from other descriptions of the species. These elongate sluglike animals were white in color with a row of 10–12 opaque white papillae along each side of the notum. A white defensive secretion was expelled from these papillae when the animals were disturbed. Some isolated papillae were also present on the notum. The cephalic tentacles were long, thin, and sharply tapering. They became abruptly narrower just at their bases. Small eyes were located at the outer bases. The ctenidium projected partially from the opening of the mantle cavity near the head and somewhat toward the right side. The foot was translucent and wide, extending well beyond the notum, with its anterior end expanded into a pedal veil. The three specimens are deposited at the Museo de Ciencias Naturales de Tenerife, Canary Islands.

Acknowledgments. We are indebted to Juan J. Bacallado, head of the project "Galápagos: Patrimonio de la Humanidad" for inviting us to participate in the scientific trips to the Galapagos Islands. Ignacio Díez Cortaberría made the definitive drawing based on the original sketches of the authors.

Literature Cited

- BERGH, R. 1875. Malacologische Untersuchung. Pp. 315–376, pls. 40–48 in C. Semper, Reisen im Archipel der Philippinen. Zweiter Theil. Wissenschaftliche Resultate nos. 8 & 9.
- BERGH, R. 1890. Die Titiscanien, eine Familie der rhipidoglossen Gastropoden. Morphologisches Jahrbuch 16(1):1–26, pls. 1–3.
- BURN, R. 1975. *Titiscania limacina* Bergh, 1875, an unusual gastropod new to Australia. Australian Shell News, 11:1.
- EMERSON, W. K. 1991. First records for *Cymatium mundum* (Gould) in the Eastern Pacific Ocean, with comments on the Zoogeography of the Tropical Trans-Pacific Tonnancean and non-Tonnancean prosobranch gastropods with Indo-Pacific faunal affinities in West American Waters. The Nautilus 105(2):62–80.
- FINET, Y. 1991. The marine mollusks of the Galapagos Islands. Pp. 253–280 in M. James (ed.), Galapagos Marine Invertebrates. Plenum Press: New York.
- FINET, Y. 1994. The Marine Mollusks of the Galapagos Islands: A Documental Faunal List. Muséum d'Histoire Naturelle: Genève. 180 pp.
- GOSLINER, T. M., D. W. BEHRENS & G. C. WILLIAMS, 1996. Coral Reef Animals of the Indo-Pacific. Sea Challenger: Monterey, California, 314 pp.
- HOUSTON, R. S. 1990. Reproductive systems of neritimorph ar-

- chaegastropods from the eastern Pacific with special reference to *Nerita funiculata* Menke, 1851. *The Veliger* 33(1): 103–110.
- MARCUS, EV. & ER. MARCUS, 1967. American opisthobranch molluscs. *Studies in Tropical Oceanography* 6:1–256.
- SAITO, H. & K. TSUCHIYA. 1990. Rediscovery of *Titiscania shinkishihataii* Taki, 1955. *Chiribotan* 21(3):45–47. (in Japanese)
- SCOTT, B. J. & R. KENNY, 1998. Superfamily Neritoidea. Pp. 694–702 in P. L. Beesley, G. J. B. Ross & A. Wells (eds.), *Mollusca: The Southern Synthesis. Fauna of Australia*. Vol 5. CSIRO Publishing: Melbourne.
- STRACK, H. L. 1998. The Rumphius Biohistorical Expedition. A story of present and past marine biology. *Vita Marina* 45(1–2):17–40.
- TAKI, I. 1955. New species of *Titiscania*, a rare archaeogastropod mollusk, form Hachijo-jima. *Bulletin of the National Science Museum, Tokyo* 2(2):50–53.

International Commission on Zoological Nomenclature

The following Applications concerning mollusks were published on 30 March 2001 in Volume 58, Part 1 of the *Bulletin of Zoological Nomenclature*. Comment or advice on any of these applications is invited for publication in

the *Bulletin* and should be sent to the Executive Secretary, I.C.Z.N., c/o The Natural History Museum, Cromwell Road, London SW7 5BD, U.K. (e-mail: iczn@nhm.ac.uk).

Case 3158. *Helix lucorum* Linnaeus, 1758 and *Helix punctata* Müller, 1774 (currently *Otala punctata*; Mollusca, Gastropoda): proposed conservation of usage of the specific names by replacement of the syntypes of *H. lucorum* with a neotype.

Case 3175. *Ampullaria canaliculata* Lamarck, 1833 (currently *Pomacea canaliculata*; Mollusca, Gastropoda): proposed conservation of the specific name.

The following Opinion concerning mollusks was published on 30 March 2001 in Volume 58, Part 1 of the *Bulletin of Zoological Nomenclature*. Copies of Opinions can be obtained free of charge from the Executive Secretary, I.C.Z.N., c/o The Natural History Museum, Cromwell Road, London SW7 5BD, U.K. (e-mail: iczn@nhm.ac.uk).

Opinion 1965. *Euchilus* Sandberger, 1870 and *Stalioa* Brusina, 1870 (Mollusca, Gastropoda): *Bithinia deschiensiana* Deshayes, 1862. and *Paludina desmarestii* Prévost, 1821 designated as the respective type species. with the conservation of *Bania* Brusina, 1896.